

Remarks

Claims 1, 2, 4-12, 14, 15, 18-21, 23, 25, 29-36, 38, 39, 41, and 51-53 were pending in the subject application. By this Amendment, claims 1, 15, 18, 30, 31, 51, and 52 have been amended, claims 2, 7, 21, 23, 25, 29, 32, 33, 35, 36, 38, 39, and 41 have been cancelled, and new claims 54-66 have been added. Claims 18-20, 30, 31, and 34 remain pending but withdrawn from consideration. Support for the new claims and amendments can be found throughout the subject specification and in the claims as originally filed. Entry and consideration of the amendments presented herein is respectfully requested. Accordingly, claims 1, 4-6, 8-12, 14, 15, 51-66 are currently before the Examiner for consideration. Favorable consideration of the pending claims is respectfully requested.

Applicants acknowledge that claims 18-20, 30, 31, and 34 have been withdrawn from further consideration as being drawn to a non-elected invention. However, Applicants wish to reserve the right to request rejoinder of the non-elected process claims upon an indication of an allowable product claim in accordance with MPEP §821.04.

As an initial matter, Applicants gratefully acknowledge the Examiner's indication that claims 10 and 15 are objected to but would be allowable if rewritten into independent form to include the limitations of any base and intervening claims.

Claims 1, 9, 11, and 51-53 are rejected under 35 USC §102(b) as anticipated by Yang *et al.* (2003). The Yang *et al.* reference is cited by the Examiner as disclosing CdS:Mn/ZnS core shell quantum dots that were prepared using a reverse micelle route. Applicants respectfully assert that the Yang *et al.* reference does not teach or suggest the claimed invention. However, by this Amendment, Applicants have amended independent claims 1 and 52 to incorporate the elements of both of claims 2 and 7. Applicants note that new independent claim 54 incorporates the elements of claim 10. Applicants also note that claims 2, 7, and 10 are not included under this rejection. Accordingly, reconsideration and withdrawal of the rejection under 35 USC §102(b) is respectfully requested.

Claims 1, 5-9, 11, 12, and 51-53 are rejected under 35 USC §103(a) as obvious over Yang *et al.* (2003) in view of Weiss *et al.* (U.S. Patent No. 5,990,479). Claims 1, 2, 4, 5, 6, 9, 11, 12, and 51-53 are rejected under 35 USC §103(a) as obvious over Yang *et al.* (2003) in view of Nie *et al.* (U.S.

Published Application No. 2005/0136258) and further in view of Kotov (U.S. Patent No. 6,689,338). Claims 1, 2, 5, 6, 9, 11, 12, 14, and 51-53 are rejected under 35 USC §103(a) as obvious over Yang *et al.* (2003) in view of Svarovsky *et al.* (U.S. Published Application No. 2008/0039816). The Yang *et al.* reference is cited for the teachings as set forth in the §102 rejection. The Weiss *et al.* patent is cited as teaching luminescent semiconductor nanocrystal compounds capable of linking to an affinity molecule to form an organo luminescent semiconductor nanocrystal probe capable of luminescence and/or absorption and/or scattering or diffracting when excited by an electromagnetic radiation source (or broad or narrow bandwidth) or a particle beam, and capable of exhibiting a detectable change in absorption and/or of emitting radiation in a narrow wavelength band and/or scattering or diffracting when so excited. The Nie *et al.* publication is cited as teaching nanostructures including a quantum dot and a hydrophobic protection structure. The Kotov patent is cited as teaching that folic acid and small peptides such as somatostatin with distinct affinity to cancer cells are to be considered for conjugation to nanoparticles. The Svarovsky *et al.* publication is cited as teaching that quantum dots are small semiconductor particles that exhibit quantum confinement. The Examiner concludes that, at the time of the subject application, the rejected claims would have been obvious to a person of ordinary skill in the art in view of the teachings of the cited references. Applicants respectfully traverse these grounds for rejection.

Applicants respectfully assert that the cited references, taken alone or in combination, do not teach or suggest the claimed invention. Applicants respectfully submit that the CdS:Mn/ZnS quantum dots (Qdots) of the present invention are multimodal (*e.g.*, fluorescent and paramagnetic). The Mn (II) ion (dopant) is paramagnetic (as it possesses unpaired electrons) and it serves a fluorescent center. Traditional Qdots are non-dopant based and do not exhibit similar properties. The subject application distinguishes over the cited art in several aspects: (i) it teaches Qdots having multimodality (as noted above), (ii) it teaches improvement of the paramagnetic property by further surface modification with silica-Gd chelates, and (iii) it provides for the co-existence of two paramagnetic centers within the same nanoparticle (paramagnetic Mn in the CdS:Mn/ZnS crystalline core and paramagnetic Gd(III) chelated to silica shell). The design of Qdot-based nanoparticle compositions (with two paramagnetic centers and one having both luminescent and paramagnetic properties) of the present invention is novel and nonobvious over the art.

In addition, as noted herein in regard to the §102 rejection based on the primary reference Yang *et al.*, Applicants have amended claim 1 to incorporate the elements of both of dependent claims 2 and 7. Applicants respectfully assert that the cited references do not teach or suggest claim 1 as amended herein. Claims 2 and 7 are not included together under any of the §103 rejections.

As the Examiner is aware, in order to support a *prima facie* case of obviousness, a person of ordinary skill in the art must generally find both the suggestion of the claimed invention, and a reasonable expectation of success in making that invention, in light of the teachings of the prior art and from the general knowledge in the art. *In re Dow Chemical Co.*, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988). One finds neither the suggestion, nor the reasonable expectation of success, of Applicants' claimed invention in the cited references. Accordingly, reconsideration and withdrawal of the rejections under 35 USC §103(a) is respectfully requested.

It should be understood that the amendments presented herein have been made solely to expedite prosecution of the subject application to completion and should not be construed as an indication of Applicants' agreement with or acquiescence in the Examiner's position.

In view of the foregoing remarks and amendments to the claims, Applicants believe that the currently pending claims are in condition for allowance, and such action is respectfully requested.

The Commissioner is hereby authorized to charge any fees under 37 CFR §§1.16 or 1.17 as required by this paper to Deposit Account 19-0065.

Applicants invite the Examiner to call the undersigned if clarification is needed on any of this response, or if the Examiner believes a telephonic interview would expedite the prosecution of the subject application to completion.

Respectfully submitted,



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